Defense Information Infrastructure (DII)

Common Operating Environment (COE)

Statement of Functionality (SOF)
for the
Textual Observation Database (MDTXT) Segment

21 July 1999

Prepared for:
Space and Naval Warfare Systems Command
Environmental Systems Program Office
(SPAWAR PMW-185)

Prepared by:
Fleet Numerical Meteorology and Oceanography Center
Monterey, CA

and

Integrated Performance Decisions, Inc.
Monterey, CA

Table of Contents

List of Figures

List of Tables

1 SCOPE

1.1 Identification

This document describes the functionality of the Textual Observation Database (MDTXT) Segment of the Navy Integrated Tactical Environmental Subsystem (NITES). MDTXT is a Defense Information Infrastructure (DII) Common Operating Environment (COE) *shared database* segment for the storage of textual METOC observations and bulletins.

1.2 System Overview

TEDS is the Meteorological and Oceanographic (METOC) Database for the NITES system. It is a DII COE shared database, with separate segments for different types of data and different functionalities. For each data type, there is a Database segment that provides the database schema and "static" database tables such as the Master Station Library in the LLT Observation database. There is also an Application Program Interface (API) segment that provides programming interfaces to the database. The API segments provide functionality for programs to cause data to be ingested into the database, to get a catalog of data in the database, to retrieve data by query or by individual item ID, to delete data from the database, etc. Underlying all of TEDS is a Commercial Off-the-Shelf (COTS) Relational Database Management System (RDBMS). This is currently Informix v7.2x, but could be any RDBMS.

1.3 Document Overview

Section 2 provides a more detailed overview of TEDS, while Section 3 contains more detail concerning the specific functionality provided by the MDTXT segment.

2 TEDS FUNCTIONALITY OVERVIEW

The software described in this document forms a portion of the TEDS component of NITES. On 29 October 1996, the Oceanographer of the Navy issued a Program Policy statement in letter 3140 Serial 961/6U570953, modifying the Program by calling for five seamless software versions that are DII COE compliant, preferably to level 5.

The five versions are:

- NITES Version I — The local data fusion center and principal METOC analysis and forecast system
- NITES Version II — The subsystem on the Joint Maritime Command Information System (JMCIS) or Global Command and Control System (GCCS) (NITES/Joint METOC Segment (JMS))
- NITES Version III — The unclassified aviation forecast, briefing, and display subsystem tailored to Naval METOC shore activities (currently satisfied by the Meteorological Integrated Data Display System (MIDDS))
- NITES Version IV — The Portable subsystem composed of independent Personal Computers (PCs)/workstations and modules for forecaster, satellite, communications, and Integrated Command, Control, Communications, Computer, and Intelligence Surveillance Reconnaissance (IC4ISR) functions (currently the Interim Mobile Oceanographic Support System (IMOSS))
- NITES Version V — Foreign Military Sales (currently satisfied by the Allied Environmental Support System (AESS))

NITES I acquires and assimilates various METOC data for use by US Navy and Marine Corps weather forecasters and tactical planners. NITES I provides these users with METOC data, products, and applications necessary to support the warfighter in tactical operations and decision making. NITES I provides METOC data and products to NITES I and II applications, as well as other systems requiring METOC data, in a heterogeneous, networked computing environment.

The NITES I Concept of Operations and system architecture require that the METOC Database be distributed both in terms of application access to METOC data and products and in terms of physical location of the data repositories. The organizational structure of the database is influenced by these requirements, and the components of this distributed database are described below.

In accordance with DII COE database concepts, the METOC Database is composed of six DII COE-compliant *shared database* segments. Associated with each shared database segment is an

Application Program Interface (API) segment. The segments are arranged by data type as follows:

Data Type	**Data Segment**	**API Segment**
Grid Fields	MDGRID	MAGRID
LLT Observations	MDLLT	MALLT
Textual Observations and Bulletins	MDTXT	MATXT
Remotely Sensed Data	MDREM	MAREM
Imagery	MDIMG	MAIMG
Climatology Data	Segments named by data type. To date, only DBDB-V segments (MDDBV and MADBV) have been released.	

A typical client-server installation is depicted in Figure 2-1 on the next page. This shows the shared database segments residing on a DII COE SHADE database server, with a NITES I or II client machine hosting the API segments. Communication between API segments and shared database segments is accomplished over the network using American National Standards Institute (ANSI)-standard Structured Query Language (SQL).

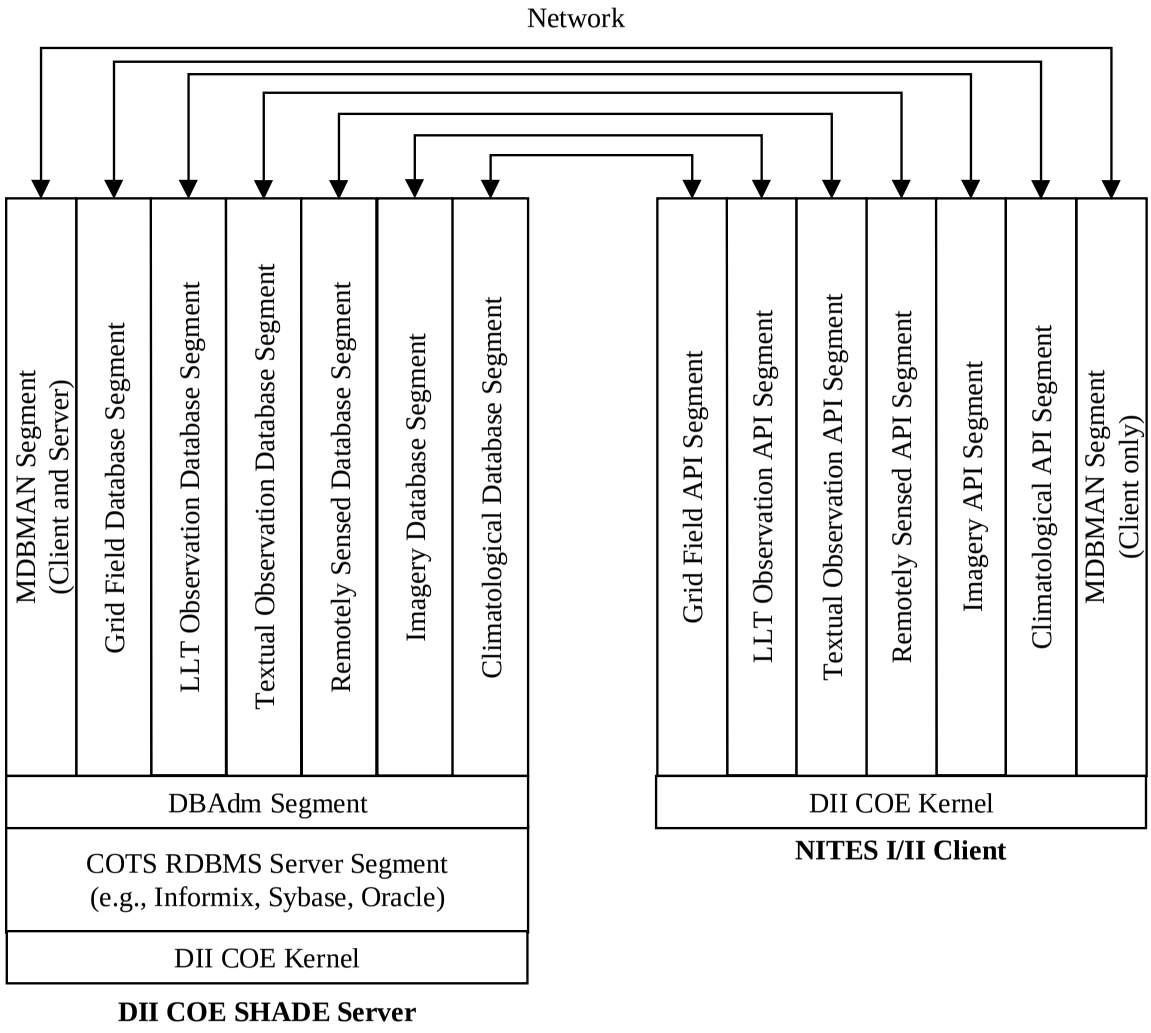

Figure 2-1. NITES METOC Database Conceptual Organization

3 MDTXT SEGMENT FUNCTIONALITY

The MDTXT segment deals with textual observations and bulletins. Textual observational data are primarily ASCII formatted forecasts or bulletin/warning oriented messages. Textual observation data can be associated with a specific geographic point and time, but more generally are associated with a geographical area or region. Types include Forecast Reports, Warnings, and Notices. Depending on the type of textual observation, the reporting station or organization and the area or region affected is decoded and stored along with the textual portion of the message. Textual observation data are typically displayed as text by a client application.

Table 3-1 below shows the types and subtypes of textual observations handled by MATXT. This information is derived from WMO-386, Volume I, Part II, Attachment II-5, Tables A and B1, and from AWSR 105-2 (for U.S. Air Force - specified bulletins).

Table 3-1. Textual Observation Data Types

Type	Type (Table A) Designator	Subtype (Table B1) Designator
Forecast Reports	F	E = Extended Forecast H = Upper Air Thickness I = Iceberg J = Radio Warning Service K = Tropical Cyclone Advisories L = Local Area Forecasts M = Temperature Extremes O = Guidance Q = Other Shipping V = Volcanic Ash W = Winter Sports X = Miscellaneous
Surface Reports	S	T = Sea Ice U = Snow Depth X = Miscellaneous
Upper Air	U	X = Miscellaneous

Table 3-1. Textual Observation Data Types

Type	Type (Table A) Designator	Subtype (Table B1) Designator
Warnings	W	A = AIRMET/SIGMET C = Tropical Cyclone (SIGMET) D = Tropical Cyclone Discussion E = Tsunami F = Tornado (USAF) G = River Flood H = Hurricane M = High Seas (USAF) O = Other S = SIGMET T = Tropical Cyclone (Typhoon) U = Severe Thunderstorm V = Volcanic Ash (SIGMET) W = Military Weather Warnings (USAF) X = Misc. Weather Warnings (USAF)
Notices	N	G = Hydrological H = Marine N = Nuclear Emergency O = METNO/WIFMA P = Product generation delay T= Test Message W = Warning Related or Cancellation

The MDTXT segment provides the database schema. During installation, MDTXT sets up the basic database tables needed to store gridded data. MDTXT also provides data to build dynamic database tables, such as detail tables, that are built “on the fly” as new data are ingested. Finally, MDTXT provides data to set up “static” database tables (i.e., those that change only infrequently).